

## CLAIMS

1. A microcomputer having a user mode and a debugging mode, said microcomputer comprising:

5 a central processing unit formed to be switchable between said user mode and said debugging mode, for executing instructions in each of said user mode and said debugging mode; and

switching means for switching said central processing unit from said user mode to said debugging mode when a forced break is  
10 input through a terminal that is not used in said user mode.

2. The microcomputer as defined in claim 1, wherein:

said microcomputer has an on-chip debugging function and comprises a debugging terminal connected to a communications line  
15 for transferring debugging information, that is used for on-chip debugging, to and from an external debugging tool; and

a forced break is input through said debugging terminal.

3. The microcomputer as defined in claim 2, wherein:

20 said microcomputer comprises a first monitor means for transferring data to and from a second monitor means, determining a primitive command to be executed according to said data received from said second monitor means, and executing the determined primitive command, said second monitor means being provided outside  
25 said microcomputer for converting a debugging command into at least one primitive command;

a single communications line for transferring said data in a half-duplex bidirectional manner is connected to said debugging

terminal;

said central processing unit executes a user program when in said user mode and executes said primitive command when in said debugging mode; and

5       said switching means switches said central processing unit from said user mode to said debugging mode when a forced break is input through said debugging terminal.

4.     The microcomputer as defined in claim 1, further comprising:

10       means for holding a terminal for the input of a forced break at a first level which is either one of high and low, during a state in which no external debugging tool is connected,

      wherein said central processing unit starts execution in said user mode when said terminal for inputting said forced break is at  
15     said first level at a time of reset, or starts execution in said debugging mode when said terminal for inputting said forced break is not at said first level at a time of reset.

5.     The microcomputer as defined in claim 2, further comprising:

20       means for holding a terminal for the input of a forced break at a first level which is either one of high and low, during a state in which no external debugging tool is connected,

      wherein said central processing unit starts execution in said user mode when said terminal for inputting said forced break is at  
25     said first level at a time of reset, or starts execution in said debugging mode when said terminal for inputting said forced break is not at said first level at a time of reset.

6. The microcomputer as defined in claim 3, further comprising:  
means for holding a terminal for the input of a forced break  
at a first level which is either one of high and low, during a state  
in which no external debugging tool is connected,

5 wherein said central processing unit starts execution in said  
user mode when said terminal for inputting said forced break is at  
said first level at a time of reset, or starts execution in said  
debugging mode when said terminal for inputting said forced break  
is not at said first level at a time of reset.

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7. Electronic equipment comprising:  
the microcomputer of claim 1;  
an input source of data that is to be a processing object of  
said microcomputer; and

15 an output device for outputting data that has been processed  
by said microcomputer.

8. Electronic equipment comprising:  
the microcomputer of claim 2;

20 an input source of data that is to be a processing object of  
said microcomputer; and

an output device for outputting data that has been processed  
by said microcomputer.

25 9. Electronic equipment comprising:

the microcomputer of claim 3;

an input source of data that is to be a processing object of  
said microcomputer; and

an output device for outputting data that has been processed  
by said microcomputer.

10. Electronic equipment comprising:

5 the microcomputer of claim 4;

an input source of data that is to be a processing object of  
said microcomputer; and

an output device for outputting data that has been processed  
by said microcomputer.

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11. Electronic equipment comprising:

the microcomputer of claim 5;

an input source of data that is to be a processing object of  
said microcomputer; and

15 an output device for outputting data that has been processed  
by said microcomputer.

12. Electronic equipment comprising:

the microcomputer of claim 6;

20 an input source of data that is to be a processing object of  
said microcomputer; and

an output device for outputting data that has been processed  
by said microcomputer.

25 13. A debugging system for a target system including a  
microcomputer, said debugging system comprising:

a second monitor means for performing processing for  
converting a debugging command developed by a host system into at

least one primitive command;

a first monitor means for transferring data to and from said second monitor means, determining a primitive command to be executed according to said data received from said second monitor means, and  
5 executing the determined primitive command;

a central processing unit formed to be switchable between a user mode and a debugging mode, for executing said primitive command in said user mode;

a debugging terminal provided on a chip including said central  
10 processing unit and connected to a single communications line for transferring said data in a half-duplex bidirectional manner; and

switching means for switching said central processing unit from said user mode to said debugging mode when a forced break is input through said debugging terminal.